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The great 2004 Indian Ocean tsunami: constraints on the earthquake source and transoceanic simulation

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The tsunami triggered by the 2004 Mw 9.0 Sumatra earthquake was observed by an unprecedented amount of records, from conventional tide gauges to altimetry satellites, not to mention countless videos and photographs. We test here several source parameters for the earthquake in order to explain the relevant observations, and to better constrain the extent and geometry of the seismic rupture. For this kind of long seismic rupture a non-static initiation of the tsunami in the numerical modeling is considered and discussed.

We also focus on the tsunami impact in La Réunion Island where a 60 cm peak-to-trough signal was recorded on the tide gauge located in La Pointe des Galets. Significant damage was reported in several different harbours (11 boats sunk) and the available observations have been gathered. We discuss the observed sea-level variations thanks to numerical modeling.